

### AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method comprising:

determining, by a computing device, ~~at~~ the configuration of a system of resources;  
determining, by the computing device, ~~the~~ processing requirements of an application running on the system of resources utilizing an application characterization database;  
analyzing, by the computing device, the determined configuration and requirements in order to attempt to optimize the performance of the application;  
generating, by the computing device, optimization suggestions from the analysis;  
and

dynamically ~~causing~~ applying, by the computing device, applying of the optimization suggestions;

wherein the application characterization database includes:

a static application characterization database storing information regarding fixed characteristics of the application; and

a dynamic application characterization database storing information regarding mutable characteristics of the application, wherein the dynamic application characterization database is empty at initialization of the application characterization database and is gradually established as the application is executed.

2. (Currently Amended) The method of claim 1, wherein dynamically causing applying of the optimization suggestions includes:

dynamically ~~causing~~ allocating, by the computing device, allocating of resources to the execution of and interaction with the application; and

dynamically ~~causing~~ utilizing, by the computing device, utilizing of acceleration tools.

3. (Currently amended) The method of claim 2, wherein dynamically causing utilizing acceleration tools includes causing utilizing tools selected from a group including:

primitive performance libraries;  
managed runtime optimization settings; and  
reordering portions of application execution.

4. (Currently amended) The method of claim 1, wherein the determining ~~at~~the configuration of a system of resources includes utilizing a device and environment characterization database.

5. (Original) The method of claim 4, wherein the device database includes information regarding the types of resources in the system of resources and information regarding the physical capabilities of these resources.

6. (Original) The method of claim 5, wherein the environment database includes information regarding the configuration, substantially current status, and substantially current capacity of the resources within the system of resources.

7. (Original) The method of claim 6, wherein device and environment characterization database is incrementally generated as each of the resources of the system of resources is powered-on.

8. (Currently Amended) The method of claim 4, wherein the device and environment characterization database is dynamically generated utilizing a service including:

collecting, by the computing device, data from sensors coupled with the resources;  
analyzing, by the computing device, the data collected;  
inferring, by the computing device, an execution context characterization;  
estimating, by the computing device, the capacity of each resource; and  
updating, by the computing device, the device and environment characterization database.

9.-10. (Cancelled)

11. (Currently Amended) The method of claim 10, wherein generation of the static application characterization database comprising is generated utilizing:

determining, by the computing device ~~by~~ at the application's compile time, the data types utilized by the application;

determining, by the computing device ~~at~~ by the application's compile time, the frequency of the usage of the data types;

determining, by the computing device ~~at~~ by the application's compile time, the resource required by the application; and

updating, by the computing device, the static application characterization database with the determined information.

12. (Currently Amended) The method of claim 11, wherein generation of the dynamic application characterization database comprising is generated utilizing:

reading, by the computing device, the static application characterization database;

collecting, by the computing device, runtime application data usage;

analyzing, by the computing device, application usage and identifying resource usage bottlenecks;

updating, by the computing device, the dynamic application characterization database.

13. (Currently Amended) The method of claim 10, further including:

predicting, by the computing device, application performance after causing applying the suggested optimizations;

monitoring, by the computing device, the actual application performance to generate empirical data;

comparing, by the computing device, the actual application performance to the predicted performance;

~~performing the method of claim 1, and~~ utilizing, by the computing device, the empirical data ~~when during the~~ analyzing the determined configuration and requirements in order to attempt to optimize the performance of the application.

14.-29. (Cancelled)

30. (Currently Amended) A system comprising:

~~an application;~~

a system of resources ~~capable of~~configured to executing and interacting with ~~an~~the application;

~~a processor;~~

a Dynamic Application Optimizer, operated by the processor, and configured to ~~capable of~~ attempting to dynamically optimize the performance of the application;

a Device & Environment Database ~~capable of~~ providing information to the Dynamic Application Optimizer about the system of resources; and

an Application Characterization Database ~~capable of~~ providing information to the Dynamic Application Optimizer about the distributed application, wherein the Application Characterization Database includes:

a static application characterization database storing information regarding fixed characteristics of the application; and

a dynamic application characterization database storing information regarding mutable characteristics of the application, wherein the dynamic application characterization database is empty at initialization of the application characterization database and is gradually established as the application is executed.

31. (Currently Amended) The system of claim 30, wherein the Dynamic Application Optimizer is ~~capable of~~configured to:

~~determining-determine the~~a configuration of a system of resources utilizing the Device & Environment Database;

~~determining-determine the~~ processing requirements of an application running on the system of resources utilizing the Application Characterization Database;

~~analyzing-analyze~~ the determined configuration and requirements in order to attempt to optimize the performance of the application;

~~generating-generate~~ optimization suggestions from the analysis; and

dynamically causing applying of the optimization suggestions.

32. (Currently Amended) The system of claim 31, wherein the Dynamic Application Optimizer is further ~~capable of~~ configured to:

- ~~predicting~~ predict application performance after applying the suggested optimizations;
- ~~monitoring~~ the actual application performance to generate empirical data;
- ~~comparing~~ compare the actual application performance to the predicted performance; and
- ~~utilizing~~ utilize the empirical data to attempt improve application performance.

33. (Currently Amended) The system of claim 32, wherein the Dynamic Application Optimizer is ~~capable of~~ configured to cause applying the optimization suggestions by:

- dynamically causing allocating portions of the system of resources to the execution of and interaction with the application; and
- dynamically causing utilizing acceleration tools;

wherein the acceleration tools are selected from a group including:

- primitive performance libraries;
- managed runtime optimization settings; and
- reordering portions of the application execution.

34. (Original) The system of claim 32, wherein the Device & Environment Database includes:

- a device portion having information regarding the types of resources in the system of resources and information regarding the physical capabilities of these resources; and
- an environment portion having information regarding the configuration, substantially current status, and substantially current capacity of the resources within the system of resources.

35. (Currently Amended) The system of claim 32, wherein the Device & Environment Database is ~~capable of being~~ dynamically generated by:

collecting data from sensors coupled with the resources;  
analyzing the data collected;  
inferring an execution context characterization;  
estimating the capacity of each resource; and  
updating the device and environment characterization database.

36. (Cancelled)

37. (Currently Amended) The system of claim ~~36~~35, wherein the static application characterization database is generated ~~utilizing~~by:

determining, ~~by~~at the application's compile time, the data types utilized by the application;

determining, ~~at~~by the application's compile time, the frequency of the usage of the data types;

determining, ~~at~~by the application's compile time, the resource required by the application; and

updating the static application characterization database with the determined information.

38. (Currently amended) The system of claim 37, wherein the dynamic application characterization database is generated ~~by~~utilizing:

reading the static application characterization database;

collecting runtime application data usage;

analyzing application usage and identifying resource usage bottlenecks;

updating the dynamic application characterization database.

39. (Original) The system of claim 37, wherein the system of resources includes a plurality of hardware architectures; and  
the application is a distributed application.

40. (Original) The system of claim 39, wherein the system of resources includes the Dynamic Application Optimizer.

41. (Currently Amended) An article comprising:  
a computer readable storage media; and  
a plurality of instructions stored on the computer readable storage media and,  
configured to enable a machine to perform:  
~~a storage medium having a plurality of machine accessible instructions, wherein when the~~  
~~instructions are executed, the instructions provide for:~~  
determining ~~the~~ a configuration of a system of resources;  
determining ~~the~~ processing requirements of an application running on the system  
of resources utilizing an application characterization database;  
analyzing the determined configuration and requirements in order to attempt to  
optimize the performance of the application;  
generating optimization suggestions from the analysis; and  
dynamically causing applying of the optimization suggestions;  
wherein the application characterization database includes:  
a static application characterization database storing information regarding fixed  
characteristics of the application; and  
a dynamic application characterization database storing information regarding  
mutable characteristics of the application, wherein the dynamic application  
characterization database is empty at initialization of the application characterization  
database and is gradually established as the application is executed.

42.(Currently Amended) The article of claim 41, wherein the ~~instructions providing for~~  
dynamically causing applying the optimization suggestions includes ~~instructions providing for:~~  
dynamically causing allocating of resources to the execution of and interaction  
with the application; and  
dynamically causing utilizing of acceleration tools.

43.(Currently Amended) The article of claim 42, wherein the ~~instructions providing for~~ dynamically causing utilizing of acceleration tools ~~includes instructions providing for~~ utilizing tools selected from a group including:

- primitive performance libraries;
- managed runtime optimization settings; and
- reordering portions of application execution.

44. (Currently Amended) The article of claim 41, wherein the ~~instructions providing for~~ determining at the configuration of a system of resources includes ~~instructions providing for~~ utilizing a device and environment characterization database.

45. (Original) The article of claim 44, wherein the device database includes information regarding the types of resources in the system of resources and information regarding the physical capabilities of these resources.

46. (Original) The article of claim 45, wherein the environment database includes information regarding the configuration, substantially current status, and substantially current capacity of the resources within the system of resources.

47. (Currently Amended) The article of claim 46, wherein ~~the article includes instructions providing for~~ the instructions are further configured to enable the machine to perform incrementally generating the device and environment characterization database as each of the resources of the system of resources is powered-on.

48. (Currently Amended) The article of claim 44, wherein the instructions are further configured to enable the machine to perform~~providing for dynamically generating~~ the device and environment characterization database ~~to be dynamically generated~~ utilizing a service including instructions providing for:

- collecting data from sensors coupled with the resources;
- analyzing the data collected;
- inferring an execution context characterization;



estimating the capacity of each resource; and  
updating the device and environment characterization database.

49.-50. (Cancelled)

51. (Currently Amended) The article of claim ~~50~~41, wherein the instructions ~~providing~~  
are further configured to enable the machine to perform for the static application characterization  
~~database include instructions providing for the database's generation~~generating the static  
application characterization database by~~utilizing~~:

determining, ~~by~~at the application's compile time, the data types utilized by the  
application;

determining, ~~at~~by the application's compile time, the frequency of the usage of the data  
types;

determining, ~~by~~at the application's compile time, the resource required by the  
application; and

updating the static application characterization database with the determined information.

52. (Currently Amended) The article of claim 51, wherein the instructions ~~providing for~~  
~~the dynamic application characterization database include instructions providing for generating~~  
~~the database~~are further configured to enable the machine to perform generating the dynamic  
application characterization database by~~utilizing~~:

reading the static application characterization database;

collecting runtime application data usage;

analyzing application usage and identifying resource usage bottlenecks;

updating the dynamic application characterization database.

53. (Currently Amended) The article of claim ~~50~~41, ~~further including the~~  
~~providing for~~are further configured to enable the machine to perform:

predicting application performance after applying the suggested optimizations;

monitoring the actual application performance to generate empirical data;

comparing the actual application performance to the predicted performance;  
~~performing the method of claim 1, and~~utilizing the empirical data ~~when~~during  
the analyzing the determined configuration and requirements in order to attempt to optimize the  
performance of the application.

54. - 67. (Cancelled)